NISTIR 6778

Guidelines for NIST Staff Participating in Voluntary Standards Developing Organizations' Activities

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June 2002

PREFACE

These Guidelines were prepared by the Standards Services Division (SSD[1]), the NIST organization that coordinates the formulation and implementation of the voluntary standards and conformity assessment policies of the Federal Government. A revision of the October 1989 Guidelines, this document provides guidance and background for NIST staff considering or beginning participation in voluntary standards activities and NIST managers who support these activities. The basic material is supplemented with extensive appendices, including a list of useful references, and pertinent websites that are noted throughout the document.

Supplementary information and assistance are available from the staff of SSD. Within SSD, the National Center for Standards and Certification Information (NCSCI) maintains an extensive collection of standards and standards-related information (NIST North, Room 164 ext . 4040, e-mail – ncsci@nist.gov; web site – http://ts.nist.gov/ncsci) and NCSCI staff are available to assist you. Another important source of information is NIST's Standards Advisory Committee (SAC) (see Appendix A), which consists of at least one representative from each Operating Unit (OU). Your OU Office can provide the name(s) of your representative(s).

We welcome your input on this document. Please forward suggestions for improvements, comments or questions to SSD at ext. 4000 or oss@nist.gov.

ACKNOWLEDGMENTS

The authors wish to thank the following persons for their assistance in reviewing, editing and organizing this document: Dr. Belinda L. Collins, Technology Services; Michael Hogan, Information Technology Laboratory, and JoAnne Overman, Standards Services Division.

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[1] In the Spring of 2002, the Office of Standards Services (OSS) was renamed the Standards Services Division (SSD) as part of a Technology Services reorganization.

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INTRODUCTION

Background
Standards have been an integral part of the mission of the National Institute of Standards and Technology (NIST)[1] since its establishment (as the National Bureau of Standards) in the early 1900's. As part of its mission, NIST works with two types of standards, *fundamental measurement standards,* or *physical standards,* such as those for mass, length and time; and *documentary,* or *normative, standards* that specify characteristics of products, processes and testing[2]. These Guidelines deal only with the latter and provide a brief overview of the U.S. documentary standards process, followed by detailed guidance for NIST staff on their participation in the process, and concluding with appendices addressing specific issues of interest. ***For specific details on participating in standards activities, please go to page 4.***

NIST's Role in Documentary Standards
As the Nation's measurement laboratory, a primary focus of NIST has been the development of documentary standards for measurement and test methods. The main products of this focal area include standard test methods, standard test practices, and standard guides. In addition, members of each Operating Unit (OU) at NIST participate in developing standards that are relevant to its area of expertise. Standards in which NIST staff have played a key role in developing include those for information technology, semiconductors, optical measurements, materials specifications, interoperability for intelligent manufacturing, energy conservation and fire safety. A recent publication[3] describes NIST documentary standards activities in each of these areas.

Process for Creating Documentary Standards
NIST staff participate in both phases of the development of documentary standards: first, in the laboratory research that underpins the standards; and second, in the preparation of the standards documents themselves, typically through a standards committee or working group. NIST does not publish documentary standards, but participates actively in their development and contributes significant technical expertise as a foundation. In this respect, the U.S. system differs significantly from the government-driven standards systems in most other countries. In fact, within the United States, there are more than 400 standards developing organizations (SDOs) that provide the infrastructure for the preparation of standards documents. In the standards development process, government personnel participate in SDO activities along with representatives from industry, academia, and other organizations[4] and consumers. It is important to emphasize that the U.S. SDOs are private-sector organizations, and that the Federal government is simply one of several stakeholders and participants.

U.S. SDOs typically operate through a consensus process that is characterized by openness, transparency, balance, and due-process or mechanisms for ensuring adherence to organizational procedures, including provision for appeals. Compliance with these standards is voluntary

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[1] The NIST mission statement is "To develop and promote measurement, standards, and technology to enhance productivity, facilitate trade, and improve the quality of life."
[2] ISO/IEC Guide 2 (Standardization and related activities – General vocabulary, 1996), available in the NCSCI reference collection. Appendix B provides a concise review of standards terminology.
[3] NIST Special Publication 974, <u>NIST Centennial Standards Symposium, Standards in the Global Economy: Past, Present, and Future,</u> January, 2002.
[4] The U.S. standards system is described in Appendix C.

(except in cases where they are adopted or referred to by government regulatory agencies). The standards produced by these SDOs are therefore commonly termed *voluntary consensus standards*, or simply *voluntary standards*, the term used in these Guidelines.

Standards Developing Organizations
More than 400 organizations based in the United States develop voluntary standards, but 20 SDOs develop approximately 80 % of all such standards[5]. Of the 20 SDOs, ASTM International (formerly known as the American Society for Testing and Materials) generates the largest number of standards, and ASTM standards committees attract by far the greatest number of NIST memberships. For example, the January 2001 edition of the "Directory of DOC Staff Memberships on Outside Standards Committees" listed 537 ASTM memberships[6] held by NIST, more than an order of magnitude greater than the number for any other domestic SDO. The directory shows that other major U.S. SDOs in which NIST staff are very active include the Institute of Electrical and Electronic Engineers (IEEE), the American Society of Mechanical Engineers (ASME), and the American Concrete Institute (ACI).

NIST also contributes to the development of international standards. NIST staff are active in two major private-sector international standards organizations, namely the International Organization for Standardization (ISO) (http://www.iso.org) and the International Electrotechnical Commission (IEC)[7] (http://www.iec.ch) located in Geneva, Switzerland. Department of Commerce staff also participate in other international organizations such as the International Telecommunication Union (ITU) (http://www.itu.int) and the Internet Engineering Task Force (http://www.ietf.org). The January 2001 edition of the directory of DOC staff memberships indicates that 63 NIST staff participate in ISO Technical Committees and 40 in IEC Technical Committees; the data also show that NIST holds 15 leadership positions (chairs, vice chairs, secretaries, etc.) in these organizations. The importance of ISO/IEC participation by NIST staff, and by U.S. representatives in general, is discussed in Appendix E, which deals with U.S. activities in the international voluntary standards community. Current information on NIST participation in standards organizations can be obtained at http://ts.nist.gov/sami.

Standards Coordination
Private Sector Coordination
The American National Standards Institute (ANSI)[8] (http://www.ansi.org) is a private, non-profit organization (501(c)3) that provides coordination for the U.S. voluntary standardization and conformity assessment activities and accredits standards developers. ANSI does not itself develop American National Standards (ANSs); rather it facilitates development by providing procedures for establishing consensus among qualified groups. ANSI ensures that its guiding principles - consensus, balance, transparency, due process and openness - are followed by the more than 175 distinct entities currently accredited under one of ANSI's three methods of accreditation (organization, committee or canvass). ANSI-accredited standards organizations develop national and, in many cases, international standards, addressing the critical trends of technological innovation, marketplace globalization and regulatory reform.

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[5] Table 1, Appendix C.
[6] Note that some staff members hold more than one membership position, so the total number of participants is less.
[7] ISO and IEC are described in Appendix D.
[8] The January 2001 directory lists 102 NIST staff associations with ANSI.

ANSI also provides leadership for the U.S. standards system in the international arena as well as domestically. As such, it is the official U.S. member of ISO and sponsors the U.S. National Committee of the IEC[9]. ANSI's essential role in the U.S. standards community has been recognized by a Memorandum of Understanding with NIST. Appendix C provides more information on ANSI.

Finally, it should be noted that there are standards-related activities at NIST other than participation in voluntary standards development. These activities take place primarily within SSD and other parts of Technology Services, rather than in the Measurement and Standards Laboratories. Examples are key roles in the International Organization of Legal Metrology (OIML), the National Conference on Weights and Measures, the Pacific Area Standards Congress (PASC), the Pan American Standards Commission (COPANT), and Standards Working Groups with Russia and Ukraine. SSD is also heavily engaged in conformity assessment[10], the second arm of the standardization process.

Federal Coordination

In 1996 Congress enacted the National Technology Transfer and Advancement Act of 1995 (NTTAA), Public Law 104-113, which codified principles of the Office of Management and Budget (OMB) Circular A-119, "Federal Participation in the Development and Use of Voluntary Consensus Standards and in Conformity Assessment Activities" (1998). This legislation directs Federal agencies to use voluntary standards in lieu of governmental standards whenever feasible, thereby depending significantly less on in-house standards for their regulatory and procurement activities. The legislation also asks agencies to promote participation by their staff in standards development to ensure creation of standards that are usable by both Federal agencies and the private sector.

The NTTAA also directs NIST to coordinate the efforts of the agencies to meet the new requirements, and report annually on Federal use of standards. NIST's approach to coordination is described in Appendix G, which also provides more detail about the NTTAA and OMB Circular A-119. Further information on the NTTAA and OMB Circular can be obtained at http://ts.nist.gov/oss.

NIST itself must report annually on the number of NIST staff who participate in standards activities, on the SDOs in which they participate, the number of standards used by NIST, and any government-unique standards issued by NIST in lieu of using a voluntary standard.

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[9] Appendix D.

[10] As its name states, this important activity deals with the various mechanisms for ensuring that a product does, in fact, meet a specified standard. The U.S. conformity assessment system is outlined in NISTIR 6014 (Maureen A. Breitenberg, "The ABC's of the U.S. Conformity Assessment System", NISTIR 6014, April 1997. Available on-line at http://ts.nist,gov/ncsci).

INITIATING PARTICIPATION IN A STANDARDS ACTIVITY

Up to this point, we have presented the "big" picture of standards activities by identifying some of the key players, important procedures, and coordination activities. We now turn to procedures for you, the NIST employee, as you participate in the development of standards.

The first decision is to participate in a particular standards activity. You may choose to be a member of a committee, a subcommittee or a working group; you may also choose to serve as its secretary or chair. Your choice of an activity should be driven by the mission of your Operating Unit as well as by NIST's overall mission. The activity should allow you to incorporate NIST research and technical expertise into a standard that is needed by industry, government and other facets of the U.S. and/or international community.

The decision that you, a NIST employee, should participate in a standards developing organization is made by you in conjunction with your management based on your unit's mission and goals, resource commitments, and the technical competence required. Once the decision is made, you and your manager should then add an appropriate element to your Performance Plan. This should include a clear statement of your time and resource commitment to the activity, as well as a set of goals and milestones. While this can be difficult, given the consensual nature of the standards development process, it is extremely important to identify and document NIST unique contributions to an eventual standard. Your accomplishments should be reviewed according to your OU's normal practice.

For each assignment to be undertaken, NIST also requires that participants complete and have their Division Chief (or higher) approve NIST Form 83, Record of Committee Assignment (a copy is attached as Appendix K), at the time of appointment and then annually. You are asked to report any changes as they occur to keep the information up-to-date. These forms are submitted to staff in SSD for inclusion in an electronically accessible standards committee participation database that is used by NIST managers and staff to promote effective participation, coordinate committee activities, support NIST research programs, and allocate available resources.

Form 83 can be submitted either in hard copy format (available on INFORMS and the NIST e-approval system), or electronically via http://ts.nist.gov/sami. The forms must be complete and provide accurate information on the committee, organization and assignment. Hard copy forms require the approval signature. The electronic forms require an indication that approval has been obtained; SSD staff verify via e-mail the approval authority for the electronic version.

The standards committee participation database is available on-line at http://ts.nist.gov/sami and in hard copy as the "Directory of DOC Staff Memberships on Outside Standards Committees". SSD staff annually review the information in the database to ensure its accuracy and currency. On request, SSD staff will also provide specialized reports regarding NIST voluntary standards participation.

For further information concerning the Standards Committee Participation database, the NIST Form 83, or related issues, contact: Global Standards and Information Program, Stop 2160, (301) 975-4035; the e-mail is sami-oss@nist.gov.

FUNDING FOR TRAVEL AND FEES

NIST OUs support staff travel to standards committee meetings in the same way that they support other official travel. As in the case of professional societies, NIST is unable to cover membership fees or dues to most SDOs[11]. If an organization only develops standards, NIST is able to cover its participation fees, however. Guidance for qualifying organizations is given in the Administrative Manual Subchapter 3.02, Standards and Professional Committees. Examples of organizations that only develop standards include ASTM and IEEE-SA. Payment of organizational fees to bodies such as these is coordinated through SSD, which collects and pays the annual fees. Each Fall, SSD staff send to each OU the current list of NIST participants in ASTM or other officially recognized organizations, along with the total amount of applicable administrative service fees for OU verification and review. The OUs return the lists, noting any changes planned for the upcoming calendar year and providing the cost center(s) to be used for payment of the service fees. Individual membership fees are not required when staff represent NIST at ANSI and certain other SDOs to which NIST pays institutional membership fees[12]. Institutional memberships approved by NIST are listed in Appendix J.

In addition, NIST OUs pay administrative service fees to ANSI when NIST staff become secretariats of committees of international organizations such as ISO and IEC, of which ANSI is the recognized U.S. member body. While the funds are provided by the appropriate OUs, SSD headquarters coordinates the payment of secretariat fees with both the OU's and ANSI.

RESPONSIBILITIES OF NIST REPRESENTATIVES IN VOLUNTARY STANDARDS DEVELOPING ORGANIZATIONS' ACTIVITIES

Things to Know:
The SDO

You should become familiar with the purpose, organization, structure and operating procedures of the SDO you have selected. Because it may be relevant to later Federal agency deliberations about the use of the standard or other document, you should determine if the committee is: (1) balanced; (2) follows agreed-on procedures (including transparency and due process); (3) maintains openness; and (4) operates by consensus. ANSI accreditation[13] is one indication that these procedures have been followed. Participants in standards committees should review the purpose and scope of each particular activity, and should seek clarification of any ambiguities. Participants should also be aware that the use or abuse of standards procedures by participants in standards developing activities in order to restrict competition is improper and violates various Federal and State antitrust statutes; such violations are subject to civil and criminal prosecution (see Appendix H).

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[11] See the Administrative Manual, Subchapter 3.02.

[12] Ibid.

[13] A list of ANSI-accredited SDOs is maintained by ANSI and is available from SSD.

Many SDOs use Robert's Rules of Order. You should become familiar with these common practices to be effective. ANSI and several SDOs periodically offer a training course on effective participation [14] as well as specific operating procedures.

<u>NIST Policy</u>
Representing NIST
NIST Administrative Manual Subchapter 3.02 establishes policies and procedures for the acceptance and maintenance of memberships on government and non-government standards and professional committees working in areas related to NIST activities.

You should be familiar with NIST's positions on major policy issues and, if necessary, be prepared to articulate official positions. In most instances, NIST staff participate in aspects of standards development that are closely related to their technical expertise. Nevertheless, issues related to general governmental policy or sensitive issues may arise, particularly in higher-level committees. NIST participants should never express personal opinions on significant policy issues since they might be construed to be official NIST policy. Seek help and advice of your OU management as well as SSD Headquarters staff on policy and procedural matters.

Keep NIST Management Informed
You should keep your supervisor informed of significant developments, both technical and policy, that occur at committee meetings. In addition, certain "high-impact" issues should be brought to the attention of your OU management and the SSD Director. An issue can be considered to have high impact if it meets any of the following criteria:
1. It may be brought to the attention of the NIST Director or the Secretary of Commerce by one or more outside groups, such as Congress, another Federal agency, a trade organization or standards developer, a firm or an influential individual.
2. It requires broad coordination across internal NIST OUs or Institute boundaries.
3. It could entail anti-trust violations or even the concern of potential anti-trust violations.
4. It generates a need for policy guidance regarding appropriate limits of NIST responsibility, whether technical or financial.
5. It may result in outside criticism of NIST by reputable persons or organizations.
6. It would have significant impact on U.S. international trade or on the health, safety, or environmental conditions of U.S. citizens.

Ethical Obligations and Potential Antitrust Liability
When you participate in standards-developing activities, you will almost certainly be involved with representatives of the private sector, imposing numerous responsibilities, ethical obligations, and possible antitrust considerations. Federal employees are subject to constraints on conduct that may not apply to your private sector counterparts. These include limitations and restrictions on acceptance of gifts, meals, travel expenses, and the like. If you have any questions, or if you are concerned about ethic issues, call the Ethics Division of the DoC Office of General Counsel at 202-482-5384 for a full explanation of all ethical rules pertaining to working with the private sector on standards activities. Appendix H provides additional information on these obligations. Nonetheless, Federal agencies and employees have some protection against antitrust liability with respect to standards activities consistent with their

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[14] See "Attend Training Programs", page 7.

agency mandates, and should not be deterred from participating in standards work for fear of such liability.

Consider International Standardization

The United States has obligations specified under the Trade Agreements Act of 1979 (1995 revision) and the World Trade Organization Agreement on Technical Barriers to Trade. Therefore, you should be aware of international standards and standardization activities related to their national standards committee work. You should also be mindful, per the NIST Standards Policy (see Appendix F), to promote the inclusion of U.S. technology, both existing and emerging, in national and international standards.

Keep Records

All participants should maintain a file of committee-related information, including the committee's by-laws, membership lists, minutes of meetings, final ballots, and relevant correspondence. You, or your unit, should retain this file for at least five years after the conclusion of the standards activity, and follow NIST procedures for records retention.

Promote the Metric System, Energy Efficiency, and Public Heath and Safety

Whenever appropriate, you should encourage use of the metric system, environmentally sound and energy efficient materials, products, systems, services, or practices and consider issues related to public health and safety.

Encourage the Use of Performance Standards

Whenever appropriate, you should encourage the development and use of performance standards. Performance criteria in standards generally do not stand in the way of innovation, whereas prescriptive specifications tend to do so. However, prescriptive standards may sometimes be more appropriate, particularly for describing test methods or procedures. Nevertheless, keep in mind that design specifications or reference to patented devices, materials or processes, may deter technical progress and may be prohibited by some SDO's.

Attend Training Programs

ANSI offers a number of helpful training programs, which are described at the ANSI website: http://web.ansi.org/public/services.html. Similarly, many SDOs, such as ASTM (http://www.astm.org) also offer training courses for their committee members.

The following ANSI courses were offered when this publication went to print:
- Taking the Secret Out of Secretariat – ANSI's Course for Effective ISO Secretariat Operations;
- Introduction to Standards and Conformity Assessment;
- Strengthening the U.S. Voice in International Standardization – A Course on the Operation of U.S. Technical Advisory Groups (TAGs) to ISO Activities;
- How Your Organization Can Benefit from Participating in the National and International Standard Development Process;
- Leadership Training – Managing Standards Activities Effectively;
- From Delegate to Diplomat – Representing the U.S. in International Standards Activities;
- The American Way – A course on the ANS Development Process;

- Developing Voluntary Consensus Standards for Government Use; and
- Introduction to ANSI and the World of Standards.

In addition, NIST offers a short training program for new employees to familiarize them with the standards development process and the NIST procedures for participating in standards activities. Information on these courses can be obtained from SSD Headquarters at (301)-975-4000.

Recognize Standards Work
NIST annually presents the Edward Bennett Rosa Award to recognize outstanding achievement in or contributions to the development of meaningful and significant engineering, scientific, or documentary standards either within NIST or in cooperation with other Government agencies or private groups. The award consists of an engraved plaque and a $5,000.00 honorarium. If you are aware of a NIST participant who meets the announced criteria, recommend him/her to your supervisor for nomination. Additional information on this award can be found at http://www-i.nist.gov/admin/pers/hrawards.htm.

SIGNIFICANT DEVELOPMENTS

NIST Policy
In 1998 when the NIST Director charged SSD and the SAC with the development of a NIST Policy on Voluntary Standards, the resulting document, adopted by the Executive Board in April 1999[15], signaled a major change in the way that standards activities are managed at NIST. The Policy Statement includes the following sentence:

To achieve voluntary standards that meet national needs in a timely fashion, NIST manages its standards activities strategically by setting priorities for voluntary standards activities appropriate to the overall NIST mission and by allocating staff and resources effectively.

The new policy for strategic standards management contrasts sharply with the bottoms-up approach that had been followed. Thus instead of depending solely on the interests and initiative of individual staff members, the Policy requires that the NIST mission and the programmatic priorities of the Operating Units be adequately considered during the selection of voluntary standards projects. These projects must be well planned, adequately staffed and funded, and represent a significant element of the Performance Plans of staff. In short, standards projects should not be "bootlegged", but be planned and managed strategically within NIST Operating Units. A strategic approach to standards development is described in more detail in NISTIR 6292[16].

Additional information on NIST policy can be found in the Administrative Manual, Subchapter 3.02, Standards and Professional Committees (http://www-i.nist.gov/admin/mo/adman/contents.htm).

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[15] Appendix F.
[16] Krista J. Leuteritz, *"Towards Strategic Management of Standards at NIST"*, NISTIR 6292, May 1999.

National Standards Strategy

In September 1998 NIST challenged the U.S. standards community to develop a national strategic approach to advance U.S. interests at the international level. A NIST publication provides an overview summary[17] of the National Standards Summit. Following the summit, SSD staff served as members of the strategy development group, along with representatives of industry and standards developing organizations, to create a national standards strategy. On September 7, 2000, the American National Standards Institute (ANSI) approved the National Standards Strategy (NSS) for the United States. The strategy establishes a framework that can be used by all interests – companies, government, non-governmental organizations, standards developers and consumers – to improve U.S. competitiveness abroad while continuing to provide strong support for domestic markets and, at the same time, addressing key quality-of-life issues such as the environment. It builds on the strengths of the U.S. system by proposing a set of strategic and tactical initiatives within that framework that can be used by all interests to meet national and individual organizational objectives. As part of implementation of the strategy, NIST has provided a grant to ANSI to further U.S. interests in areas of international standardization and conformity assessment. The NSS can be viewed on the ANSI web page at http://www.ansi.org.

ANSI/NIST MOU

On December 27, 2000, a Memorandum of Understanding (MOU) between ANSI and NIST was signed to facilitate the implementation by both parties of the U.S. National Standards Strategy. The MOU is intended to improve domestic communication and coordination among both private and public sector parties in the U.S. on voluntary standards issues and increase the effectiveness of U.S. Government agency participation in the national and international voluntary standards-setting process. It also facilitates and strengthens the recognition of ANSI as the representative of U.S. interests at the international level by all participants. A copy of the MOU may be viewed at http://ts.nist.gov/tsap.

NIST and ANSI collaborate actively in a number of activities, most notably World Standards Day. NIST and ANSI co-sponsor the U.S. celebration of World Standards Day held in October. Both are active in the World Standards Day planning committee to ensure that the varied U.S. standards interests are effectively represented in the celebration.

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[17] Krista J. Leuteritz and Walter G. Leight, *"Toward a National Standards Strategy: Conference Report"*, NISTIR 6290, February 1999.

APPENDIX A

The Standards Advisory Committee

The Standards Advisory Committee, or SAC, is NIST's coordination body for standards issues and was chartered in April of 1995 to:

1. Advise the Director and Operating Unit (OU) Directors on issues relating to NIST participation in standardization activities;
2. Provide broad NIST representation in the development of recommendations for NIST standards policies and procedures, including mechanisms for setting priorities for participation in national and international standards and conformity assessment activities;
3. Provide a mechanism for NIST input into analysis of standards-related developments outside the Institute that have implications for NIST and to provide information to the Interagency Committee on Standards Policy as appropriate;
4. Assist the Director and OU Directors to ensure that NIST standards and conformity assessment participation is effective and efficient and to exchange information among OUs concerning standards and conformity assessment-related activities; and
5. Ascertain and resolve potential conflicts within NIST and within other agencies on specific standards and conformity assessment activities.

The membership of the SAC consists of the Director, Standards Services Division, who serves as Chair, and at least one appointed representative from each NIST Operating Unit. The SAC works closely with the NIST Director to carry out standards-related mandates. NIST employees can take their standards- and conformity assessment-related questions to their SAC representatives. A current SAC roster is available on the SAC website (http://ts.nist.gov/ts/htdocs/210/sac/sac.htm).

In consultation with the SAC, NIST is defining its own strategies for standards- and conformity assessment-related activities and is providing a checklist for information critical to the successful implementation of those strategies.

The SAC assists in the creation of each OU's standards portion of its strategic plans and also assists in the implementation of strategic management of standards activities at NIST.

APPENDIX B

Standards Terminology (Walter G. Leight)[18]

Introduction

A college physics professor once noted that we tend to be very surprised when we open a faucet and get no water, or when we flick a switch and the lights fail to come on. It was his view that we should be amazed each time we perform those simple actions and get the expected results. It is even more miraculous that manufacturers can assemble parts and components, often from many states or even many countries, producing complex mechanical or electronic devices that reliably perform as designed and are easily maintained for long periods of time. Thanks to standardization and effective methods of conformity assessment, we can have confidence that our TV sets, automobiles, weapons systems, and myriad other products will contribute to our health, safety, comfort, and quality of life.

We lacked these "miraculous" benefits early in this century. Indeed, in 1904 there was a devastating fire in Baltimore, MD, that raged for more than a day, destroying more than 1500 buildings covering a large area. Fire companies came from cities as far away as New York to help extinguish the flames, but most were useless because their hoses, all built to their own local specifications, could not be coupled to Baltimore's fire hydrants!

In addition to the now-obvious need for compatibility, standards have become increasingly more important to protect health, safety, and the environment and to foster commerce on a global basis. In every buyer-seller relationship, domestic or foreign, we not only rely on accepted standards, but we seek a global approach expressed in the ideal: for each product, one standard, one test, accepted worldwide. There is now a clear confidence-building path from Standards to Product Acceptance, whether for camera film or space vehicles.

About Standards

There are several different kinds of standards, mostly developed by the private sector, but also by government, and they have various types of applications. To add to the confusion, we in the United States use the same word, "*standard*," to refer to both the fundamental, physical standards of measurement (such as the kilogram) and to documentary, or normative standards. Other languages, such as French and Spanish, use separate words for physical and documentary standards. Of more practical importance is the contrast between a *performance* standard – which specifies what a product is supposed to accomplish – and a *design* standard that spells out in detail such matters as the composition of the product and how it is to be made. In general, performance standards are far preferable to design standards since they allow greater flexibility in product design and development, and foster innovation. In some instances, such as within a company, higher authority prescribes in an authoritarian manner the standard that will be used in that company, whereas the preponderant majority of U.S. standards are based on a consensus process where the developmental committees consider many points of view. Finally, some standards [or *regulations*] are *mandated* by governmental regulatory agencies, while those

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[18] Excerpt from *"Preserving the Miracle"*, W.G. Leight, in Partnerships in RMS Standards - A Newsletter for Professionals, January 2000 (Volume 4, Number 1).

developed in the private sector are usually *voluntary* in the dual senses that their use is optional, and that they are developed through efforts contributed to the process on a voluntary basis.

Within the private sector, some standards are *proprietary* since they are developed and used only within the individual companies that produce them for their own use. More often, there is enough interest in commonality that standards are developed by groups from across the country that have mutual interests in the subject, and some of these become known as *national standards*. In most other countries, the one standards developer determines the national standard; in the United States there are literally hundreds of developers. However, the American National Standards Institute (ANSI) has a process through which developers may request adoption of some or all of their output as American National Standards (ANS). *Regional standards* may be adopted by many agreeing nations, especially in other parts of the world; a prime example is the set of regional standards now adopted by the European Union. On a still larger scale, international organizations seek to develop standards that will be accepted around the world. The best known are those of the International Organization for Standardization (ISO) and the International Electrotechnical Commission (IEC).

There is a similar hierarchy of governmental standards, starting with those at the state and local levels, national (Federal Government), regional, and international. These are often promulgated as *Purchasing Specifications*, dictating which kinds of products governmental agencies will buy, but this does not preclude manufacture of non-conforming products that satisfy private purchasers. On the other hand, governmental *regulations* – on the whole issued for public safety or for the protection of health or the environment – apply to everyone within the jurisdiction. It is important to note that both the purchasing specifications and regulations may be based on voluntary standards developed in the private sector. Indeed the National Technology Transfer and Advancement Act (NTTAA) now requires that federal agencies consider whether existing voluntary standards, either domestic or international, can be adopted (for example, by reference) in lieu of "reinventing the wheel." Secretary of Defense Perry pioneered the effort to reduce the DOD practice of writing new specifications instead of taking advantage of voluntary standards already on the books.

The U.S. Standards System (Belinda. L. Collins)[19]

Background
<u>Historical</u>
Standards efforts began as a private-sector enterprise in the United States slightly over 100 years ago, in a pragmatic and sectoral way. Thus, in the beginning, the Society of Automotive Engineers (SAE) developed automotive standards, ASTM developed test methods for materials, ASME developed boiler and pressure vessel codes, while NFPA developed standards for fire safety and fire resistance, and so on. The dominance of the United States as an economic entity immediately after World War II reinforced this system and, with the possible exception of Canada, there was little need to worry about activities in markets beyond our borders. Since the existing decentralized system met domestic market needs and allowed manufacturers to develop products with acceptable levels of technology and safety, the United States did not feel the need to develop a centralized, government-run standards system. Instead, the responsibility for coordinating this complex entity fell to ANSI.

<u>ANSI and Its Roles</u>
ANSI is a private-sector federation founded in 1918 by several SDOs and Federal Agencies. The federation is comprised of more than 700 company members, 30 government agencies, 20 institutions and 260 professional, technical, trade, labor and commercial organizations. ANSI receives most of its financial support from private-sector dues and the sale of documents. There is no direct subsidy to ANSI from the Federal Government.

Unlike the SDOs discussed below, ANSI does not itself develop standards. Rather, it functions as a central clearinghouse and coordinating body for its member organizations, which in turn develop standards on a decentralized, consensus basis. ANSI provides guidelines for standards bodies to follow in managing the consensus standards development process in a fair and open manner. It also accredits U.S. standards-developing organizations for compliance with these guidelines, and can approve standards submitted by accredited SDOs, designating them as American National Standards. Many of these standards carry dual or triple designations, such as ANS/UL 123. At last count, ANSI had accredited approximately 250 SDOs and lists about 13,000 standards as American National Standards.

ANSI is the recognized U.S. member body to the International Organization for Standardization (ISO) and, through the U.S. National Committee, to the International Electrotechnical Commission (IEC). It also holds the international secretariat to the Joint Technical Committee (JTC-1) of ISO and IEC, which develops standards in information technology. ANSI is also the U.S. member body to the Pacific Area Standards Congress (PASC) and to the Pan American Standards Commission (COPANT). As the U.S. representative to these bodies, ANSI convenes delegations, approves delegation members, and appoints technical groups with a broad spectrum of experts to represent the United States in deliberations of relevant international policy Boards, individual Technical Committees and Working Groups.

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[19] Excerpt from an internal NIST White Paper of the same title, prepared by B.L. Collins following the "National Standards Summit" held at NIST in September 1998.

The SDOs

There are more than 600 organizations[20] (primarily private sector) in the United States that develop voluntary standards. Government agencies, manufacturers, consumers, buyers, retailers, testing laboratories, technical experts, and other interested parties from both the United States and many other countries participate in the system, and represent individual interests. Most formal standards developing organizations operate by the consensus process, which requires openness, balance, due process, general agreement, participation of interested and affected parties, and a formal process for attempting to resolve differences of opinion. The process of developing standards is open and transparent, with written procedures covering each step of the process. The entire system is known as voluntary because participation is on a voluntary basis, and because compliance with the standards is voluntary -- unless the standards are subsequently adopted or referred to by a government authority. The voluntary standards may in turn be used by industry to build and test products and systems, or by government agencies at all levels to supplement regulations or to procure products for government use.

Table 1 lists the twenty U.S. SDOs which develop approximately 80 % of all U.S. voluntary standards. Overlap between SDOs is less than might be expected because the U.S. standards scene is largely organized by sector, but there is some overlap in activities and responsibilities. For example, NFPA, ASTM and UL all write standards related to fire and building safety, while SAE, ASTM and API write standards for petroleum products and vehicle emissions. Yet, even when two standards may appear to have the same scope, in fact they usually are not identical and frequently target different applications or test methods.

At the national level, the United States currently maintains about 93,000 standards in an active status. Table 2 shows the major categories of standards developers and their output. The Federal Government is included because it develops standards for both procurement and regulation. These efforts are declining under the mandate of the National Technology Transfer and Advancement Act of 1995 to use voluntary standards, but there is an existing inventory of standards for government-unique applications (as within DOD, for example) as well as new situations for which a government-unique standard may be required.

Trade associations represent the largest category of non-government standards developers, with approximately 300 identified. Trade associations, such as AIA or EIA, are organizations of manufacturers, suppliers, customers, service providers and other firms active in a given industry sector. These associations deal with mutual business interests, and promote the industry and its products. To address their objectives, many trade associations develop standards for the products manufactured by their members, although a few concentrate on developing standards for products used by their industries. Funding for standards development is primarily through member dues, while members of technical committees typically serve as representatives of their firm, not as individuals.

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[20] This figure includes about 150 informal organizations or consortia which typically develop *de facto* or *ad hoc* standards (Toth, 1996).

	Number of standards
Table 1	
20 Major Non-Government Standards Developers	
Aerospace Industries Association	3,000
American Association of Blood Banks	500
American Association of State Highway and Transportation Officials	1,100
American Conference of Government Industrial Hygienists	750
American Oil Chemists Society	410
American Petroleum Institute	500
American Railway Engineers Association	400
ASTM	9,900
American Society of Mechanical Engineers	600
Association of American Railroads	1,400
AOAC International	2,100
Cosmetic, Toiletry & Fragrance Association	800
Electronic Industries Association	1,300
Institute of Electrical and Electronics Engineers	680
National Association of Photographic Manufacturers	475
National Fire Protection Associations	312
Semiconductor Equipment and Materials International	450
Society of Automotive Engineers International	4,550
Underwriters Laboratories	780
U.S. Pharmacopeial Convention	5,000
American National Standards Institute	1,500[21]

Scientific and professional societies are individual membership organizations, such as ASME or IEEE, that support the practice and advancement of a particular profession. Several, particularly those in the engineering disciplines, develop technical standards. Participants in standards committees serve as individual professionals, rather than as representatives of their firm. Funding for standards development activities is principally from publication and sale of standards, as well as through direct services to industry.

Still other types of Standards developing organizations are membership organizations, such as ASTM, specifically founded to develop standards. Membership is not limited to a particular industry or profession. Membership fees are generally low, facilitating participation by individuals not sponsored by an employer. Publishing and selling standards accounts for the majority of revenues for these organizations. Some organizations, such as UL, may provide other services such as testing products to their standards.

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[21]These standards were developed by organizations other than ANSI and then published and copyrighted by ANSI as American National Standards.

Table 2			
Federal Government	Number standards	Non-Government	No. Standards
Department of Defense	34,000 [22]	Scientific and Professional Societies	14,000
General Services Admin.	2,000	Standards Developing Organizations	17,000
Other federal agencies	8,000	Trade Associations	16,000
		Developers of Informal Standards (Consortia)	2,000
Total government	44,000	Total non-government	49,000

The Role of the Federal Government

Unlike most foreign governments, the U.S. Federal Government neither operates nor finances a national standards body. Yet, the Federal government, with the strong support of the private sector, is an important player in the U.S. voluntary standards process as a purchaser, regulator, and/or an active participant in the development of specific standards. From a policy perspective, the U.S. government is concerned that the process for developing U.S. voluntary standards be transparent, fair and effective for all concerned, and represents U.S. interests effectively.

The Federal Government itself is directly concerned with setting and implementing standards through legislation, regulation or contractual obligations for sales to government purchasers. As shown in Table 2, the bulk of federal standards are developed by the Department of Defense (DOD) and the General Services Administration (GSA). Agencies adopting or, less frequently, setting standards in the fields of health and safety include the Food and Drug Administration (FDA), the Occupational Safety and Health Administration (OSHA), the Consumer Product Safety Commission (CPSC), and the Federal Aviation Administration (FAA). The Environmental Protection Agency (EPA) sets standards that regulate products and processes that affect the environment. The Federal Communications Commission (FCC) sets telecommunications equipment standards to ensure compatibility and to protect the security and integrity of the public communications network. The Department of Agriculture produces standards to promote food safety and to ensure accurate grading and marketing of agricultural products. NIST develops and maintains the primary measurement standards for physical measurements, as well as standard reference materials and data, provides technical expertise to numerous voluntary standards committees, and coordinates standards policy activities as mandated by PL 104-113 (see Appendix G).

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[22]It is important to note that these figures are steadily declining as the U.S. Department of Defense (DOD) cancels military specifications (MILSPECs) in favor of commercial standards as part of its acquisition reform activities. At last count, DOD had replaced almost 7900 MILSPECs with voluntary standards.

APPENDIX D

ISO and IEC (Christine R. DeVaux)[23]

Historical Perspective

International standardization started over 90 years ago in the electrotechnical field. While some attempts were made in the 1930's to develop international standards in other fields, it was not until the 1940's that significant efforts were devoted to international standardization. During the 1950's and 1960's, international standards work was devoted almost entirely to the development of international agreements on basic standards. These early international standards efforts primarily addressed issues related to international harmonization of such procedures and requirements as interchangeability, vocabularies, and standards for units and symbols, among others. In the 1960's and 1970's, greater emphasis was placed on using international standards in lieu of national standards. Voluntary adoption of the General Agreement on Tariffs and Trade (GATT) Standards Code in 1979 reflected growing acceptance of the concept of relying on international standards for all classes of finished products, materials, and services. In the 1980's and 1990's, there was increasing recognition of the role that standards and standards-related issues play in trade. . As a result of the Uruguay Round talks, the WTO was established in 1995. One of the Agreements under the WTO was the Agreement on Technical Barriers to Trade (TBT Agreement). As of November 1999, the WTO had 135 members, all of which are responsible for adhering to the provisions of the TBT Agreement.

Two private sector standards development organizations operating in the international arena are the International Organization for Standardization (ISO) and the International Electrotechnical Commission (IEC). Together, they form the world's largest non-governmental forum for voluntary industrial and technical collaboration at the international level. A third large standards development organization is the International Telecommunication Union (ITU). The ITU is a treaty organization that develops Recommendations in the area of telecommunications standardization. U.S. participation in the ITU is coordinated by the U.S. State Department. Those interested in learning more about the ITU can access the ITU homepage at: http://www.itu.int.

The International Organization for Standardization

The International Federation of the National Standardizing Associations (ISA) was established in 1926 to coordinate international mechanical engineering standardization activities. In 1947, the ISA was replaced by the ISO. The mission of the current ISO is "to promote the development of standardization and related activities in the world with a view to facilitating the international exchange of goods and services, and to developing cooperation in the spheres of intellectual, scientific, technological and economic activity."[24] The first ISO standard was published in 1951.

Upon its establishment in 1947, ISO membership consisted of 27 national standards bodies. The present ISO membership is comprised of standards bodies from over 130 countries, of which 90

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[23] Excerpt from *"A Review of U.S. Participation in the International Organization for Standardization (ISO) and the International Electrotechnical Commission (IEC)"*, C. R. DeVaux, NISTIR 6492, April 2000.

[24] "Introduction to ISO". *ISO Homepage.* <http://www.iso.org> (16 April 1999).

are participating member bodies, 36 are correspondent members and 7 are subscriber members.[25] Correspondent members do not participate in technical work and do not have voting rights, but are allowed to attend meetings as observers. Subscriber members are countries that pay reduced membership fees for the same privileges as correspondent members.

The scope of ISO work covers standardization in all fields except electrical and electronic standards, which are the responsibility of the IEC. The wide variety of subjects addressed by the ISO ranges from screw threads to solar energy. As of December, 1998, work in the ISO was carried out through some 2,859 technical bodies comprised of 186 Technical Committees (TC's), 576 Subcommittees (SC's), 2,057 Working Groups, and 40 Ad Hoc Study groups. At that time, this work had resulted in the publication of 11,950 ISO standards and 37 ISO/IEC Guides. In addition, 695 new work items were registered in 1998 with the majority of these items originating in the sectors of engineering technologies, electronics, information technology and telecommunications, and materials technologies.[26]

More than 75% of the ISO member bodies are governmental institutions or organizations incorporated by public law. The remainder are non-governmental standards organizations. ANSI, the U.S. member body to ISO, is one of the few private sector member bodies. The United States is currently one of the few major industrialized nations that does not have a governmental institution serving as its ISO member body.

With regard to budgets, sources of financial support and functional responsibilities, the national member bodies differ significantly. Annual budgets of ISO member bodies range from less than 1 million Swiss francs to more than 20 million Swiss francs. More than 50% of ISO member bodies, including those in Japan, Mexico, South Korea and most of the Eastern European countries, depend almost entirely or entirely on government grants as their main source of revenue. In contrast, in Canada and many countries in Western Europe and South America, ISO member bodies receive a portion of financial support from the central government that ranges anywhere from 3% to 97%. The remainder of these bodies' funding originates with subscriptions and sales of publications and certification fees, among other activities. Until recently, ANSI did not receive any direct government funding for its domestic or international standardization activities[27]. However, it should be noted that some U.S. Government agencies pay membership fees to ANSI and participate in standards development activities. ANSI's other primary sources of funding include publication sales and donations. Travel and other expenses for delegates from other countries to the ISO are often paid by governmental institutions or organizations incorporated by national law (e.g. BSI in the United Kingdom or AFNOR in France). Expenses for U.S. delegates to attend ISO committee meetings must be paid by the individuals or organizations sponsoring the travel.

Traditionally, the level of industrialization, the political and legal system, and other factors shape national standardization policies and activities. These factors also account in part for the marked differences in the approach, organizational settings, and responsibilities of national standards

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[25] *"ISO Members". ISO Homepage.* <http://www.iso.org> (21 April 1999).

[26] International Organization for Standardization, *ISO in Figures* (Geneva: ISO Central Secretariat, 1998).

[27] The FY2000 NIST Budget contained, for the first time, a $500K Grant to support ANSI's international activities.

bodies from country to country. For example, many ISO member bodies are responsible for activities relating to metrology, but this activity is the responsibility of other institutions in other countries. Similarly, certification and quality services are primary tasks for many national standards bodies, but not others.[28]

The operational costs of the ISO itself are estimated at 150 million Swiss francs per year. TC and SC Secretariat fees (80%) and revenues from subscriptions and other publications (20%) finance the Central Secretariat. Annual membership fees are calculated based on approximately 50% of a member country's gross national product and 50% of that country's trade volume. Each member is also responsible for the costs associated with the individual Technical Committee and Sub-Committee secretariats they hold.

The ISO Central Secretariat in Geneva, Switzerland coordinates ISO operations, administers voting and approval procedures, and publishes international standards.

Any member body that wishes to participate in the work of any of the 186 Technical Committees may do so without incurring additional fees. Member organizations that decide to take an active part in the work of a Technical Committee or Sub-Committee are known as "P" (participating) members of that committee or sub-committee meaning they have an obligation and right to participate in meetings and to vote. One of the P members is designated to act as the secretariat of the Technical Committee or Sub-Committee. Those nations that wish only to be kept informed of the ongoing work are called "O" (observer) members. They have the right to attend meetings as observers, but not to vote. A request to study a technical subject may be initiated by one or more member bodies or by an organization outside the ISO. If at least five members are willing to actively participate, a new technical committee will be formed.

The International Electrotechnical Commission (IEC)
Based in Geneva, Switzerland, the IEC was established in 1906. The IEC is currently composed of 49 National Committees (NC) whose countries collectively represent some 71% of the world's population, 78% of total electric energy production, and 87% of total electric energy consumption.[29] The objective of the IEC is to promote international cooperation on all questions of standardization in the fields of electrical and electronic engineering. Each National Committee is required to be as representative as possible of all electrical-related interests in its country, including manufacturers, users, governmental authorities, and educational and professional bodies. Many National Committees receive a large amount of support from industry and are recognized and financially supported by their governments.

In addition to the 49 National Committee members, there are 6 Associate members and 5 Pre-Associate members. Associate members do not participate in technical work and do not have voting rights, but are allowed to attend meetings as observers. The IEC also offers a Pre-Associate membership that provides countries with support from the IEC Central Office or

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[28] International Organization for Standardization, *ISO Members (Eighth Edition)* (Geneva: ISO Central Secretariat, 1996).

[29] *"World Development Indicators 1999 - Table 3.7: Energy Production and Use". World Bank Homepage.* <http://www.worldbank.org> (28 October 1999).

any neighboring full member National Committee to form a national electrotechnical committee. The aim of Pre-Associate membership is to enable national standardization bodies to become familiar with electrotechnical standardization at the international level with the goal of applying for Associate Membership within five years and eventually establishing a National Committee.

The work of the IEC is currently carried out by 90 Technical Committees (TCs), 95 Sub-Committees (SCs), and close to seven hundred working groups. The current committees span a wide range of electrotechnical sectors and were responsible for developing over 4000 standards by the end of 1998. In addition, 261 New Work Item Proposals were registered and 379 standards were published in 1998, primarily in the areas of: safety, household and similar equipment (20%); measurement, control and general testing (18%); electronic components and sub-assemblies (16%); and telecommunication, electronic systems and equipment (13%).[30]

Information on budget, sources of financial support and functional responsibilities for National Committees is not available. However, similar to many ISO member bodies, many National Committees depend partially or fully on government support. In addition, most of their revenue is typically derived from membership fees and sales of publications.

The operational costs of the IEC are estimated at 19.5 million Swiss francs per year. The Central Office is financed primarily by revenues from subscriptions and other publications (82%) and royalties and certification fees (16 %). Annual membership fees are calculated based 50% on a member's gross national product and 50% on that member's electricity consumption. Each member is also responsible for the costs associated with the individual Technical Committee and Sub-Committee secretariats they hold. [31]

The IEC Central Office in Geneva, Switzerland helps to coordinate IEC operations, administer voting and approval procedures, and publish international standards.

Similar to the ISO, IEC NCs which participate in a TC or an SC are 'P' members and National Committees that want to be kept informed of ongoing work are 'O' members.

Relationship between the ISO and the IEC
The ISO and the IEC have a formal agreement in place that establishes a non-duplicative and cooperative relationship between the two organizations. In accordance with this agreement, the two organizations complement each other in the field of international standardization. The IEC is responsible for issues relating to international standardization in the electrical and electronic engineering fields, whereas other areas are the responsibility of the ISO. In areas that do not relate to a particular technology, the ISO assumes responsibility for the work and ensures that any electrotechnical issues that arise are addressed in consultation with the IEC. To facilitate this coordination, the ISO and the IEC have established a Joint Presidents' Coordination Group (JPCG) and a Joint Technical Advisory Board (JTAB). Various liaisons have also been established between individual ISO and IEC Technical Committees and one Joint Technical

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[30] International Electrotechnical Commission, *IEC Annual Report*, (Geneva: IEC Central Office, 1998).
[31] Ibid.

Committee has been established in the area of information technology. These cooperative efforts help ensure non-duplication while maximizing efficiency.[32]

The ISO and IEC have significantly different structures and operational procedures due in part to different historical developments and the normal segmenting of major engineering disciplines. The two organizations also distribute tasks differently between the official staffs in Geneva and the secretariats of technical committees and subcommittees. ISO committee secretariats do most of their own work in terms of document dissemination, meeting minute preparation, photocopying, etc. In contrast, IEC secretariats rely more on the Central Office staff in Geneva for such support. The IEC has fewer members than the ISO. Whereas the IEC is comprised essentially of industrialized and newly industrialized countries, most of which also belong to the ISO, a number of lesser developed countries are members of ISO even though they do not often participate in specialized technical work.

Official Languages
The official languages of the ISO and the IEC are English, French, and Russian. Documents are developed and distributed in both English and French. TC and SC meetings may be conducted in both English and French, but WG meetings are generally not bilingual. The member body for the Russian Federation provides all interpretation and translation into or from Russian.

U.S. Member Bodies in the ISO and the IEC
ANSI (see Appendix C) and the United States National Committee (USNC) of the International Electrotechnical Commission are the U.S. member bodies to the ISO and the IEC, respectively. The USNC reports to the ANSI Board of Directors. ANSI was a founding member of the ISO and plays an active role in its governance. It is one of five permanent members to the governing ISO Council and one of four permanent members of ISO's Technical Management Board. U.S. participation, through the USNC, is also strong in the IEC. Representatives of the USNC sit on the IEC Council Board, the Committee of Action, and the Conformity Assessment Board.

ANSI credentials U.S. delegates to the ISO and IEC and provides them with: criteria and procedures to guide them in their operations and in reaching consensus on positions relating to international standards activities; advice from ANSI/USNC staff; communication on ISO/IEC TC and SC matters on which ANSI/USNC need recommendations from the delegates; and guidance on coordination between parallel national and international standards development. While U.S. delegates do not have any official government standing in ISO and IEC deliberations, they do generally represent public interest views.

U.S. Participation in the ISO
ANSI coordinates U.S. participation in ISO Technical Committees and Sub-Committees through technical advisory groups (TAGs). These TAGs are typically administered by trade associations, technical or professional societies, and government agencies. The U.S. TAG's primary purpose is to develop and transmit, via ANSI, U.S. positions on activities and ballots of relevant ISO technical committees. ANSI is responsible for establishing the TAG and often names a committee or organization that is developing parallel domestic standards to serve as the TAG.

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[32] *ISO Homepage.* <http://www.iso.org> (12 December 1999)

ANSI then generally appoints the secretariat or sponsor of the national standards developing group to serve as the TAG administrator.

U.S. Participation in the IEC
The USNC of the IEC manages U.S. participation in the technical work of the IEC. It takes part in the Commission's entire technical program and holds secretariats of approximately 30 technical committees and subcommittees concerned with semiconductor devices, household appliances, air-conditioning appliances, laser equipment, solar photovoltaic energy systems, fiber optics systems, design automation, and electrical insulation systems, among others.

The USNC appoints a technical advisor (TA) and a technical advisory group (TAG) to develop the U.S. viewpoint for each TC and SC. Technical advisors and TC/SC delegates are drawn from U.S. professional societies, trade associations, companies, government agencies, and testing laboratories concerned with the development of national electrotechnical standards. The technical advisor develops the U.S. position on IEC committee matters by consulting with the advisory group and is responsible for ensuring that the U.S. position is presented to the appropriate IEC Technical Committee.

ANSI provides secretariat services to the USNC, its Executive Committee, technical advisors, and technical advisory groups.

Development of ISO and IEC Standards[33]
Stage 1: Proposal stage
The first step in the development of an International Standard is to confirm the need for a particular International Standard. A new work item proposal (NP) is submitted for vote by the members of the relevant TC/SC to consider whether to include the work item its program. The proposal is accepted if a majority of the P-members of the TC/SC votes in favor and at least five P-members declare their commitment to participate actively in the project. A project leader responsible for the work item is normally appointed at this stage.
Stage 2: Preparatory stage
A working group of experts, the chairman (convener) of which is the project leader, usually is set up by the TC/SC for the preparation of a working draft. Successive working drafts may be considered until the working group is satisfied that it has developed the best technical solution to the problem being addressed. At this stage, the draft is forwarded to the working group's parent committee for the consensus-building phase.
Stage 3: Committee stage
As soon as a first committee draft is available, it is registered by the ISO Central Secretariat/IEC Central Office, distributed for comments and, if required, voting by the P-members of the TC/SC. Successive committee drafts may be considered until consensus is reached on the technical content. Once consensus has been attained, the text is finalized for submission as a draft International Standard (DIS).
Stage 4: Enquiry stage
The draft International Standard (DIS) is circulated to all ISO/IEC member bodies by the ISO Central Secretariat/IEC Central Office for voting and comment within a period of five months. It

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[33] Source: *"Stages of the Development of International Standards". ISO Homepage.* <http://www.iso.org> (12 December 1999).

is approved for submission as a final draft International Standard (FDIS) if a two-thirds majority of the P-members of the TC/SC are in favor and not more than one-quarter of the total number of votes cast are negative. If the approval criteria are not met, the text is returned to the originating TC/SC for further study and a revised document is circulated for voting and comment as a draft International Standard.

Stage 5: Approval stage

The final draft International Standard (FDIS) is circulated to all ISO/IEC member bodies by the ISO Central Secretariat/IEC Central Office for a final Yes/No vote within a period of two months. Technical comments received during this period are not considered at this time, but are registered for consideration during a future revision of the International Standard. The text is approved as an International Standard if a two-thirds majority of the P-members of the TC/SC are in favor and not more than one-quarter of the total number of votes cast are negative. If these approval criteria are not met, the standard is referred back to the originating TC/SC for reconsideration in the light of the technical reasons submitted in support of the negative votes received.

Stage 6: Publication stage

Once a final draft International Standard has been approved, only minor editorial changes, if and where necessary, are introduced into the final text. The final text is sent to the ISO Central Secretariat /IEC Central Office that publishes the International Standard.

Review of International Standards (Confirmation, Revision, Withdrawal)

All International Standards are reviewed at least once every five years by the responsible TC/ SC.

The United States in the Global Marketplace (Belinda L. Collins and E. Neville Pugh)[34]

Introduction
The U.S. standards system has served the Nation reasonably well domestically, but faces difficulties in the international arena. It was seen in Appendix C that our domestic system developed in a pragmatic and sectoral way, each sector being supported by its own independent private-sector SDOs. Internationally, our efforts in different industrial sectors have been uneven, excellent in some (particularly the high-tech areas) but virtually non-existent in others. We are particularly vulnerable where cross-sectoral collaboration is necessary.

Because of its decentralized and fragmented standards system, the United States is rarely able to speak with a single voice, and there tend to be numerous voices espousing different, often-conflicting views and strategies, thus causing confusion among our trading partners. We are further hindered by our tendency to regard standards as technical tools to facilitate the operation of the domestic private sector rather than as elements of trade strategy. Yet standards have become increasingly important protectionist tools as international tariffs have gradually been eliminated. Our system is in sharp contrast to the top-down, political approaches to standards practiced by the EU and other nations, which in most cases are represented by a central national standards body. It will be seen below that the U.S. position has been further threatened by the emergence of ISO and IEC as *de facto* international standards.

As pointed out in Appendix C, responsibility for the coordination of our domestic and international standards activities falls to the American National Standards Institute (ANSI). Most of its financial support comes from private-sector dues and the sale of documents. There is only a small direct subsidy to ANSI from the Federal Government[35]. Some individual Federal agencies pay dues as members, but the total amount of their support is minimal; in 1998, it represented about 2.5% of ANSI membership dues and less than 0.5% of ANSI's total budget. NIST agrees with widespread private-sector sentiment that the Federal Government should pay a fairer share.

In 1998, NIST and ANSI took an initial step toward addressing the growing international challenge by co-hosting a "National Standards Summit". The Conference, *Toward a National Standards Strategy*, was attended by more than 300 representatives of U.S. industry, SDOs, consumers, and Federal Agencies. As a result, ASTM and NIST have jointly organized a series of small workshops focused on drafting a national strategy for consideration by the full ANSI Federation. This process was still in progress when these Guidelines went to press.

International Standards – ISO and IEC
The term *international standard* has never been formally defined, but it is clear that a majority of nations now consider them as those promulgated by ISO and IEC. However, many in the U.S. standards community point out that, because of their high-quality technical content, standards

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[34] Based on an internal NIST Report, *"Toward a U.S. National Standards Strategy"* prepared by B.L. Collins and E.N.Pugh following the "National Standards Summit" held at NIST in September 1998.
[35] The FY2000 NIST Budget contained, for the first time, a $500K Grant to support ANSI's international activities.

developed by U.S.-based organizations such as ASME, NFPA, IEEE, and ASTM are used by scores of nations. NIST acknowledges the worldwide use of many U.S. standards, but shares the majority view that this will not change the dominance of ISO and IEC in the international community, and that it is more constructive to work towards incorporating these and other U.S. standards into an improved ISO system.

NIST Director Kammer has pointed out that the trend towards adoption of ISO and IEC standards is particularly noticeable in the case of emerging markets, partly because it is easier than sifting through large numbers of competing U.S. standards.[36] It was stressed that these markets represent the greatest opportunities for trade growth. For example, it was considered plausible for U.S. trade with China to increase by 100% in the first five or six years of the 21st Century; and similar large increases were envisaged with South America. He pointed out that, in contrast, trade with our traditional partners could be expected to grow by only 4-5 % annually. He concluded that "the fight is over access to the emerging markets and to the economic opportunities they represent", that standards are an important weapon in this contest.

Other developments underscore the growing importance of ISO and IEC. Under the Agreement on Technical Barriers to Trade (TBT Agreement) signed in 1995 as part of the WTO Treaty (see Appendix D), the governments of the United States and about 135 other member countries are obliged to give preference to international standards – in effect, those of ISO and IEC -- as a basis for their technical regulations. This step towards harmonization of national and international standards complements other global trends. For example, through the TransAtlantic Business Dialogue, the chief executives of more than 100 North American and European businesses have also endorsed the preference for international standards, citing regional and national standards and certification requirements as "one of the most significant barriers to Transatlantic trade".

The United States has long been active in ISO and IEC (see Appendix D), and one response to their growing importance would be increased and more organized participation in these organizations, thus ensuring that U.S. interests are well represented. However, such action is hindered by the strong perception on this side of the Atlantic that ISO and IEC favor the EU. Several examples are cited:

- *The EU enjoys disproportionate representation in ISO and IEC.* Thus each of the 15 EU member states is a voting member, whereas the United States has only a single vote. The potential for bloc voting and the coming enlargement of the EU to include Central and Eastern Europe are perceived as further tilting the playing field in the EU's favor.

- *ISO and IEC are considered to have special relationships with the EU standards organizations, the European Committee for Standardization (CEN) and the European Committee for Electrotechnical Standardization (CENELEC).* This situation is claimed to result from the Vienna and Dresden Agreements, under which the EU organizations agree to participate in and adopt ISO and IEC standards[37]. For example, if an ISO standard addresses

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[36] R.G. Kammer, Meeting with NIST Participants in ISO and IEC, NIST, December 1999.
[37] The Vienna Agreement is between ISO and CEN and the Dresden between IEC and CENELEC.

an EU Directive requirement, then it would be adopted in EC regulations and procurement requirements. But, significantly, if no international standard existed or were under development, then CEN could take over the ISO activity (after a favorable vote by the appropriate ISO committee). This allows CEN to develop a European standard and then submit it for approval as an ISO standard. No other nation or bloc has this type of relationship with ISO and IEC. Moreover, the CEN and CENELEC standards-setting processes are closed to non-Europeans (although any CEN committee that has been given the lead role under the Vienna Agreement must allow the opportunity for two ISO observers.)

The counterpoint to this perception is that the system is not inherently unfair, but that the U.S. disadvantaged position relative to that of the EU is due to our lack of organization and neglect of the details of international trade. Supporters of this argument contend that the EU is "eating our. lunch" simply because it has worked hard within ISO and IEC to promote its own agenda. In this connection, it should be noted that ASTM, ASME, IEEE, and API are currently working with ISO on four pilot projects that, if successful, would allow each to submit standards directly to ISO for consideration as Draft International Standards to be voted on by the ISO membership. Essentially this encouraging development promises to allow U.S. sector-based input into ISO.

It can also be argued that the United States has had every opportunity to work within ISO and IEC to form strategic alliances with representatives of other nations to address perceived inequities, develop common technical positions, and further mutual interests. While based in Europe[38], ISO and IEC are long-standing non-governmental *international* organizations consisting of *large numbers of national representatives*. Thus ISO is made up of the national standards organizations of 90 full-member countries, each with a single voting representative; and that national committees from more than 50 individual countries develop IEC's standards.

Elements of a U.S. National Standards Strategy (NSS)
In NIST's view, a viable U.S. NSS requires the acceptance of ISO and IEC as the international standards organizations, and the commitment to work within these bodies to eliminate current inequities and ensure that U.S. interests are fully represented. Of equal importance, the U.S. standards community must accept the authority of ANSI as the coordinator of our international activities, thus positioning us to speak with a single voice in our dealings with other nations and to ensure suitable U.S. representation at key meetings. A first step is to provide adequate financial support for ANSI to perform its critical role.

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[38] They are based in Switzerland, which is a member of EFTA but not a member of the EU.

National Institute of Standards and Technology Policy on Voluntary Standards[39]

Background
The National Institute of Standards and Technology (NIST) has the unique mission among Federal Agencies of promoting U.S. economic growth by working with industry to develop and apply technology, measurements, and standards. This policy document deals specifically with voluntary standards, sometimes called documentary or normative standards. Voluntary standards specify product characteristics, operation of a device, service or system, interface characteristics, material properties, measurement methods and procedures, and process management, among others.

The National Technology Transfer and Advancement Act (Public Law 104-113) and the most recent revisions of OMB Circular A-119 have given new impetus to NIST's traditional activities in voluntary standards and conformity assessment. Thus NIST and all Federal agencies are required to manage standards activities strategically by setting priorities that are appropriate to their overall missions and by effectively allocating staff and resources into high-priority areas. NIST has also been given the responsibility of coordinating the voluntary standards and conformity assessment activities of the Federal, state and local governments with those of the private sector.

Policy Statement
To achieve voluntary standards that meet national needs in a timely fashion, NIST manages its standards activities strategically by setting priorities for voluntary standards activities appropriate to the overall NIST mission and by allocating staff and resources effectively.

Implementation
1) NIST and its Operating Units (OUs) include voluntary standards activities within their overall strategic planning, and track progress in NIST program reviews. Each OU explicitly links its standards activities to the NIST and OU mission, and sets its priorities for individual activities accordingly. This should include deliberate selection of committee work that is most likely to result in standards used worldwide.
2) Each OU evaluates annually the relevance of its on-going and prospective standards activities, and commits to participating in the development and use of pertinent, voluntary standards as a key means of transferring NIST research. Each OU budgets personnel and resources during its normal planning process for these activities.
3) Staff Performance Plans identify relevant voluntary standards activities, including committee membership, chairmanships, secretariat services, authoring standards, and communicating key technical and policy issues to colleagues and management.
4) NIST values and rewards participation in standards activities and provides mechanisms for recognition of effective activity.
5) Through the Office of Standards Services and other NIST units, NIST provides leadership and support to facilitate more effective coordination of the voluntary standards and conformity assessment activities of the Federal, state and local governments with those of the private

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[39] Approved by the NIST Executive Board, April 1999.

sector. NIST also works with standards bodies to improve the underlying tools, both procedural and electronic, to streamline the standards development process.

APPENDIX G

NTTAA and OMB Circular A-119

Background

The National Technology Transfer and Advancement Act (P.L. 104-113), which was signed into law on March 7, 1996, charges Federal Departments and Agencies with new responsibilities for using and participating in the development of voluntary consensus standards. Specifically, the Law directs all Federal agencies and departments to *"use technical standards[40] that are developed or adopted by voluntary consensus standards bodies, using such technical standards as a means to carry out policy objectives or activities determined by the agencies and departments..."* The Act also states that *"...Federal agencies and departments shall consult with voluntary, private sector, consensus standards bodies and shall, when such participation is in the public interest and is compatible with agency and departmental missions, authorities, priorities, and budget resources, participate with such bodies in the development of technical standards..."*

There is an exception to this requirement. When *"...compliance is inconsistent with applicable law or otherwise impractical, a Federal agency or department may elect to use technical standards that are not developed or adopted by voluntary consensus standards bodies if the head of each such agency or department transmits to the Office of Management and Budget an explanation of the reasons for using such standards. Each year, beginning with fiscal year 1997, the Office of Management and Budget shall transmit to Congress and its committees a report summarizing all explanations received in the preceding year under this paragraph."*

The Act also assigned special responsibilities to NIST. It directed NIST to transmit a plan to Congress for implementing the Act; and *"to coordinate Federal, State and local technical standards activities and conformity assessment activities, with private sector technical activities and conformity assessment activities, with the goal of eliminating unnecessary duplication and complexity in the development and promulgation of conformity assessment requirements and measures."*

Interestingly, the part of the Act that deals with the utilization of voluntary standards, Section 12(d), consists of four short paragraphs and is a small part of a much larger document. The Office of Management and Budget Circular A-119[41], the document that embodies the movement for the adoption of voluntary standards by the Federal Government, is much larger, the current revision occupying more than 10 pages in the Federal Register[42]. Further, the movement to reduce reliance on government-unique standards considerably predated the passage of the Act. Thus the Circular was first issued in 1982[43], and, indeed, the Department of Defense was

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[40] "Technical standards" are defined in the Act as "performance-based or design-specific technical specifications and related management systems practices."
[41] *Entitled "Federal Participation in the Development and Use of Voluntary Consensus Standards and in Conformity Assessment Activities".*
[42] Federal Register, February 19,1998 (Volume 63, Number 33, Pages 8545-8558).
[43] The Circular was revised in 1993, and again in 1998 to bring its terminology into conformance with the Act.

pursuing this approach in the early 1960s, a process that culminated in the extensive MilSpec Reform in the mid-1990s[44]. The significance of the NTTAA is that it codified OMB A-119. Since the Act, the increased use of voluntary standards by the Federal Government is no longer simply being urged by OMB, *it is the law.*

The Circular (item 2a) states that the major goal of increasing Government's usage of voluntary standards is to "*Eliminate the cost to the Government of developing its own standards and to decrease the cost of goods procured and the burden of complying with agency regulation*". The financial benefits associated with the first item would appear to be offset by the directive of Section12 (d) of the Act that agency staff should participate with the SDOs in the development of standards. The latter item benefits the supplier, as well as the agency, and represents a significant attempt to harmonize and simplify the U.S. standards system.

NIST's Role

It was noted above that the Act assigned special responsibilities to NIST. The implementation plan[45] was transmitted to Congress on June 7, 1996, and included actions in both standards and conformity assessment. In the former case, it indicated that the required active cooperation among NIST, OMB and other federal agencies would be achieved via the Interagency Committee on Standards Policy (ICSP). Again, the ICSP was not a new organization; it was created in 1968 under NIST's chairmanship "*to encourage coordination and liaison among Federal agencies on matters related to standards*", and became responsible for coordinating the requirements of OMB A-119 upon its establishment in 1982. According to a National Research Council report[46], ICSP was virtually disbanded in 1987 because of lack of commitment on the part of regulatory agencies. This led to several actions to revitalize it, including re-chartering in 1991 and further revision in 1993.

The passage of the Act in 1996 led to significant revitalization of the Committee. A senior-level Standards Executive was appointed from each of the 26 participating agencies to serve on the ICSP, to coordinate agency standards-related activities, and to provide an annual report on the agency's standards activities. Since 1996, the ICSP has met approximately five times a year. In the three years following passage of the Act, NIST reissued the ICSP charter and worked with agencies on the 1999 revision of OMB A-119 and on the development of conformity assessment guidance. Several working groups were established, including one on strategic standards management (SSM).

The preparation of an Annual Report on OMB Circular A-119 and NTTAA Implementation is an important responsibility under the Act. It was noted above that OMB must transmit to Congress an annual report containing explanations for the adoption of agency-specific standards in lieu of voluntary standards. This report is prepared by NIST, using the individual reports of the participating agencies, and submitted to OMB for review and transmission. In addition to the "explanations", the report contains data on agency use of voluntary standards and on

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[44] Greg Saunders, *"Are the Tenets of MILSPEC Reform Incompatible with Active Participation in Voluntary Standards Activities?"*, ASTM Standardization News, May 1999.

[45] Belinda L. Collins, *"The National Technology Transfer and Advancement Act – Plan for implementation"*, NISTIR 5967, January 1997.

[46] *"Standards, Conformity Assessment, and Trade into the 21st Century"*, National Academy Press, 1995.

participation by agency staff in the development of such standards. Once the report has been transmitted, NIST publishes the report in both hard copy and on its website (http://ts.nist.gov/nttaa.)

The data in the 1997 and 1998 reports demonstrated that Federal agencies are shifting from the use of government-unique standards to voluntary consensus standards by a factor of almost 100 to 1. During this time, Federal agencies reported using 2,419 additional voluntary consensus standards in FY 97 and FY 98, while 333 voluntary consensus standards were substituted for government-unique standards. Only 27 government-unique standards were reported as having been developed/used during those two years. Unfortunately, the 1997 report showed a significant decline in participation from an informal 1996 report -- from about 5200 to 3300. The 1998 report indicated that decline in participation had continued, with about 3200 participants reported in 1998, while the preliminary data for the 1999 report suggest that while the trend continues, the rate of decline has been markedly reduced.

The establishment of the Standards Advisory Committee at NIST (Appendix A) can be traced directly to activities associated with the Circular and the Act. Because NIST also coordinates standards activities within the Department of Commerce, including publishing the annual SAMI Directory[47] and providing DOC input for the Annual Report, NIST subsequently established a Commerce Standards Committee (CSC) to coordinate standards-related activities among DOC agencies. Similarly, NIST's efforts to implement SSM for its internal programs were an outgrowth of the Act[48], and have become a model for the other agencies.

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[47] The *"Directory of DOC Staff Memberships on Outside Standards Committees"*, U.S. Department of Commerce.
[48] The need for agencies to adopt strategic standards management was recognized in the Implementation Plan.

APPENDIX H

Ethical Obligations of NIST Participants and Potential Antitrust Liability

Here are some of the areas to which you should be sensitive with regard to ethical obligations:
1. Avoiding situations that are or may appear to be breaking anti-trust laws;
2. Preventing donations of expenses by outside parties, which are prohibited by your agency;
3. Preventing excessive travel, room, and per diem expenses;
4. Avoiding the appearance of using public office for private gain;
5. Avoiding the appearance of giving preferential treatment to any organization or person; and
6. Avoiding the appearance of making a government decision outside official channels.

B.1. Anti-Trust[49]

On past occasions, participation by company interests in the development of voluntary consensus standards has triggered antitrust liability considerations. As voluntary consensus development meetings may be misconstrued as granting group advice to government officials for procurement purposes or regulatory development, similar concerns over industry representatives meeting to conduct non-competitive or trade-restrictive activities could conceivably be alleged. Two decisions pose significant concern to standards developers and their participants. In *American Society of Mechanical Engineers, Inc. v. Hydrolevel Corp.,*[50] the court found the standard-setting body (ASME) liable for a failure to employ safeguards sufficient to avoid the anticompetitive activity of volunteer members.[51] Several AMSE participants issued an interpretive letter doubting the equivalency of a competing product to meet safety standards.[52] ASME was liable even though its standards-developing procedures were, in fact, violated. More alarmingly, in *Allied Tube & Conduit Corp. v. Indian Head, Inc.*, the court held that a company can be liable for anticompetitive actions in the development of a voluntary consensus standard.[53] In this case, the voluntary consensus standards body's procedures were followed even when steel manufacturer interests technically circumvented the process by "packing" the meeting to obtain a favorable vote.[54] These decisions suggest that standards bodies and their participants can minimize their anti-trust legal risk by encouraging measures which reduce concerns over the use of voluntary consensus standards in rulemaking or procurement. First, performance-based standards may reduce anticompetitive behavior associated with design specifications. Second,

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[49] Sections B.1. and B.2. were obtained with permission from John Shoaff, EPA, from his draft, *"Business as Usual or an Instance of Reinvention and Privatization in Environmental Rulemaking? New Rules and Issues with the Use of Voluntary Consensus Standards."* They are taken from a paper that was prepared as a law school course requirement in 1999.

[50]   456 U.S. 556 (1982).

[51]   *Id.*

[52]   *Id.*

[53]   486 U.S. 492 (1988).

[54]   *Id.*

establishing and following procedural safeguards, though not foolproof, can reduce the ability of any one interest group to unduly influence a standard's development and adversely effect competition in the marketplace.[55]

B.2. Product Liability

Similar to antitrust liability, standards developers may, in rare cases, be subject to product liability suits. Historically, courts have not imposed a duty of care to standards developers for persons who are injured by products to which its standards apply.[56] Case decisions appear particularly relevant to the process of developing standards that might be destined for use in rulemaking. In *Snyder v. American Assoc. of Blood Banks*,[57] the AABB was held liable in part due to its failure to have an open standards-setting process.[58] In *Hempstead v. General Fire Extinguisher Corp*,[59] Underwriters' Laboratories was alleged to be negligent in approving of a design for a fire extinguisher.[60] More recently, the American Bureau of Shipping (ABS) may be liable because of its initial approval and annual certification of a faulty steering system that resulted in a super tanker oil spill.[61] These cases suggest that both the standards development process and related conformity assessment activities may expose a voluntary consensus standards body to liability. Consequently, government participants should be cognizant of and encourage open standards development processes as well as technically adequate conformity assessment schemes that minimize legal risk to participating parties.

As a government participant, you should be aware of both antitrust and product liability issues when entering into voluntary consensus standards or certification activities.

With regard to Agency financial, administrative, and technical support for standards-setting activities, see 31 U.S.C. 1346-7: Commissions, councils, boards, and interagency and similar groups, or contact the Office of Standards Services for more information.

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[55] For more information on the relationship of antitrust procedural safeguards in the development of standards *see* David A. Swankin, "*How Due Process in the Development of Voluntary Consensus Standards Can Reduce the Risk of Anti-trust Liability*", Prepared for U.S. Dep't of Commerce, Nat'l Inst. of Standards and Tech., NIST-GCR-90-571 (1990).

[56] Jeffrey Q. Smith et al., "*Products Liability Claims Against Voluntary Standards Developers -- An Update on Recent Developments*", at 3 (last modified Oct. 27, 1998) <http://web.ansi.org/public/library/guides/prod_liability.html> (discussing Beasock v. Dioguardi Enterprises, Inc. 130 Misc. 2d. 25, 494 N.Y.S.2d 974 (Sup. Ct. Monroe Co. 1985), *et seq.*).

[57] Snyder v. American Assoc. of Blood Banks, No. A-97, 1996 N.J. LEXIS 620 (N.J. June 4, 1996).

[58] Jeffrey Q. Smith, *supra* note 8, at 10 (discussing *Snyder, supra* note 9).

[59] Hempstead v. General Fire Extinguisher Corp., 269 F. Supp. 109 (D. Del. 1967).

[60] Jeffrey Q. Smith, *supra* note 8, at 11 (discussing *Hempstead, supra* note 11).

[61] In the Matter of: Oil Spill by the Amoco Cadiz Off the Coast of France on Mar. 16, 1978, 954 F. 2d. 1279 (7th Cir. 1992).

Summary of a Report to the ICSP on the "Potential Antitrust Liability of Federal Government Participants in Private Standards Development"

The Interagency Committee on Standards Policy (ICSP) formed a Task Group on Liability to develop recommendations on how federal agencies and their employees may avoid potential antitrust liability with respect to their participation in private standards development. The Task Group concluded that federal agencies and employees have broad protection against antitrust liability with respect to standards activities consistent with their agency mandates, and should not be deterred from participating in standards work for fear of such liability. Moreover, federal agencies and employees can further protect themselves by implementing the following recommendations:

1. Federal participants should refuse to support any proposed standards action that directly or indirectly may raise or stabilize prices, restrict the sale of products, or give undue advantage to particular competitors, unless the proposal has credible theoretical or evidentiary support with respect to a legitimate goal. When confronted with an unsupported proposal that may have anticompetitive effects, the participant should vote in the negative, or abstain from voting with stated objections, if there is significant doubt as tot he proposal's merits. If the participant believes that the proposal has merit, but it relying on the expertise of others to a significant degree, the participant's affirmative ballot should set forth this caveat.

2. To the extent practicable, federal participants should keep records relating to their participation in standards proceedings, including internal notes that indicate the reasons for their position on standards proposals.

3. In any situation where the federal participant believes the sole purpose of a standards proposal is to confer undue commercial advantage on a company or industry or is otherwise unreasonable and may have anticompetitive effects, the participant should alert the appropriate standards officer, board or committee in writing. The Task Group also suggests unresolved problems to the attention of agency legal counsel. If the agency concludes that the standards action warrants further review from an antitrust standpoint, it may seek the advice of the Department of Justice or the Federal Trade Commission.

4. To ensure that good faith participation in standards work is fully protected by the sovereign immunity defense, federal agencies should review their governing statutes, administrative rules, employment contracts, and other internal procedures to ensure that their employees are clearly authorized to engage in any necessary actions relating to private standards development and instruct employees accordingly.

(Source: November 7, 1986 Memo to the Interagency Committee on Standards Policy)

APPENDIX I

Reference Publications

The following are readily available. Summaries may be found on the SSD website http://ts.nist.gov/oss under "Publications", and a number of these publications are also available in their entirety at that URL address. Hard copies can be requested by e-mail from oss@nist.gov or at ext. 4000.

The ABC's of Standards-Related Activities in the United States (NBSIR 87-3576)
The ABC's of Certification Activities in the United States (NBSIR 88-3821)
The ABC's of the U.S. Conformity Assessment System (NISTIR 6014)
Directory of U.S. Private Sector Product Certification Programs (NIST SP 903)
Profiles of National Standards-Related Activities (NIST SP 912)
Laboratory Accreditation Activities in the United States (NISTIR 4576)
The U.S. Certification System from a Governmental Perspective (NISTIR 6077)
The National Technology Transfer and Advancement Act - Plan for Implementation (NISTIR 5967)
Report on the Open Forum on Establishment of the National Council for Laboratory Accreditation (NACLA) at the National Institute of Standards and Technology January 7, 1997 (NISTIR 6008)
Proceedings of the Open Forum on Laboratory Accreditation at the National Institute of Standards and Technology October 13, 1995 (NIST SP 902)
Directory of International and Regional Organizations Conducting Standards-Related Activities (NIST SP 767)
Directory of European Regional Standards-Related Organizations (NIST SP 795)
Standards Activities of Organizations in the United States (NIST SP 806, 1996 Edition)
Directory of Federal Government Certification and Related Programs (NIST SP 739 1998 Edition)
Directory of Federal Government Laboratory Accreditation/Designation Programs (NIST SP 808)
Directory of State and Local Government Laboratory Accreditation/Designation Programs (NIST SP 815)
Standards Setting in the European Union - Standards Organizations and Officials in EU Standards Activities (NIST SP 891, 1997 Edition)
Using Voluntary Standards in the Federal Government (NISTIR 6086)
TBT Agreement Activities of the National Institute of Standards and Technology (Annual Report)
Directory of DoC Staff Memberships on Outside Standards Committees (The latter two are available from SSD.)
Toward Strategic Management of Standards Activities at NIST (NISTIR 6292)

APPENDIX J

NIST Institutional Memberships Previously Approved by NIST Director

Acoustical Society of America
*Accredited Standards Committee, National Committee for Information Technology Standards (NCITS) [Secretariat: Information Technology Industry Council (ITI)]
*Accredited Standards Committee T1, Telecommunications (ASC T1) [Secretariat: Alliance for Telecommunications Industry Solutions (ATIS)]
*Accredited Standards Committee X9, Financial Services (ASC X9) [Secretariat: American Bankers Association (ABA)]
*Accredited Standards Committee X12, Electronic Data Interchange (ASC X12) [Secretariat: Data Interchange Standards Association (DISA)]
Alloy-Phase Diagram International Commission (APDIC)
American National Metric Council
American National Standards Institute
American Society for Engineering Education
American Society for Testing and Materials
Association for Women in Mathematics
Association of Banyan Users International
ATM Forum
Bedford Systems User Association (BSUA)
Biomedical Engineering Materials and Applications, Roundtable on (BEMA)
Biotechnology Industry Organization (Assn. of Biotech Co/Industrial Biotech Assn.)
Capital Area Novell Users, Inc.
Catalytic Advances Program
Center for Micro Engineering (CEMIE)
Chemical Reference Materials Manufacturers Association (CRMMA)
CIB - International Council for Research and Innovation in Building and Construction
CIRP - International Institution for Production Engineering Research
Coalition for Networked Information
CommerceNet
Computer Graphics Metafile (CGM) Open Consortium
Construction Industry Institute (CII)
CONVEX User Group
Co-Operation on International Traceability in Analytical Chemistry (CITAC)
Corporation for Open Systems (COS) International
Council for Chemical Research
Council on Ionizing Radiation Measurements and Standards (CIRMS)
Cray User Group
Cross-Industry Working Team
Design Institute for Physical Property Research (DIPPR)
Digital Audio-Visual Council
Electronic Industry Association/CASE-CDIF Technical Committee
Electronic Mail Association

Financial Services Technology Consortium
FORUM for International Cooperation on Fire Research
Forum of Incident Response and Security Teams (FIRST)
FIATECH-Fully Integrated and Automated Technology
IEEE Computer Society Software Engineering Body of Knowledge (SWEBOK) Industrial
    Advisory Board (IAB)
Institute of Electrical and Electronics Engineers (IEEE) Standards Association
Illuminating Engineering Society of North America
Insurance Institute for Property Loss Reduction (IIPLR)
Instructional Management System (IMS) [Secretariat: Educause]
Institute for the Study of Business Markets (ISBM)
International Congress of Distinguished Awards (ICDA)
International Federation of Library Associations and Institutions (IFLA)
International Institute of Refrigeration (IIR) [Secretariat: ASHRAE]
International Multimedia Teleconferencing Consortium (IMTC)
International Working Group/Association National de la Recherche Technique
Internet Society (ISOC)
ISODE Consortium
Mail Manager User's Group
Modernization Forum
Montgomery County High Technology Council, Inc.
Montgomery Education Connection (MEC)
Multimedia Communications Forum (MMCF)
National Association of State Information Resource Executives (NASIRE)
National Coalition for Advanced Manufacturing (NACFAM)
National Committee for Clinical Lab Standards
National Conference of Standards Laboratories (NCSL)
National Consortium for Graduate Degrees for Minorities in Engineering
National Cooperation for Laboratory Accreditation (NACLA)
National Electronics Manufacturing Initiative
National Fire Protection Association (NFPA)
National Information Infrastructure Testbed (NIIT) Consortium
National Information Standards Organization (NISO)
National Institute of Statistical Sciences (charter affiliate)
National ROLM Users Group
North American Interoperability Policy Council
Optical Internetworking Forum (OIF)
Optics and Electro-Optics Stds. Council (OEOSC)
Permanent International Committee for Research on Preservation of Materials in Marine
    Environment (COIPM)
Product Data Exchange using STEP (PDES, Inc.)
RILEM - International Union of Testing and Research Laboratories for Materials and
    Structures
Rutgers University Center for Computer Aids for Industrial Productivity (CAIP)
Software Productivity Consortium Affiliate Program (SPC)

Structural Dynamics Research Corporation (SDRC) University Consortium
Ultrasonic Industry Association, Inc.
US Green Building Council (USGBC)
U.S. Metric Association (USMA)
U.S. National Committee of the International Commission on Illumination (USNC/CIE)
U.S. Product Data Association
U.S. Technical Advisory Group (TAG) to IEC Tech. Committee 93 on Design Automation
[TAG Administrator: Electronic Industries Alliance]
*U.S. Technical Advisory Group for ISO/IEC JTC1 on Information Technology (JTC1
        TAG) [TAG Administrator: Information Technology Industry Council (ITI)]
U.S. Technical Advisory Group (TAG) to ISO Tech. Committee 2, Image Evaluation [TAG
        Administrator: Photographic & Imaging Mfrs. Assn. (PIMA)]
U.S. Technical Advisory Group (TAG) to ISO Tech. Committee 131, Fluid Power Systems
        [TAG Administrator: National Fluid Power Association (NFPA)]
U.S. Technical Advisory Group (TAG) to ISO Tech. Committee 172, Optics and Optical
        Instruments [TAG Administrator: Optics and Electro-Optics Stds. Council (OEOSC)]
U.S. Technical Advisory Group (TAG) to ISO Tech. Committee 207, Environmental
        Management
University of Minnesota Microcontamination Research Consortium (UMMRC)
Video Electronics Standards Association (VESA)
W3C Consortium
WEB 3D Consortium
X/Open User Council

*Previously approved under American National Standards Institute

APPENDIX K

NIST FORM 83 - RECORD OF COMMITTEE ASSIGNMENT

U.S. DEPARTMENT OF COMMERCE
NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY

RECORD OF COMMITTEE ASSIGNMENT

PLEASE TYPE OR PRINT YOUR RESPONSES - SEE REVERSE FOR INSTRUCTIONS

1. PURPOSE (CHECK ONE)

☐ NEW MEMBERSHIP

☐ CHANGE INFORMATION PREVIOUSLY SUBMITTTED

☐ TERMINATION OF MEMBERSHIP (COMPLETE BLOCKS 1 - 9 ONLY)

☐ OTHER (SPECIFY)

2. NAME (LAST, FIRST, MIDDLE INITIAL)

3. ORGANIZATION CODE

4. DATE

5. NIST MAILING ADDRESS (BUILDING AND ROOM)

6. NIST TELEPHONE NUMBER

7. NIST EMPLOYMENT STATUS

☐ FULL-TIME PERMANENT ☐ ANNUITANT ☐ OTHER (SPECIFY)

8A. COMMITTEE ASSIGNMENT COVERED

LEVEL (CHECK ONE)	NUMBER (IF APPLICABLE)	COMPLETE NAME OF ACTIVITY
☐ PARENT COMMITTEE		
☐ SUBCOMMITTEE		
☐ TASK OR WORK GROUP		
☐ OTHER (SPECIFY)		

8B. IF 8A IS A PARENT COMMITTEE, GO TO 9. IF 8A IS A SUBGROUP OF A COMMITTEE (e.g., a subcommittee or task group), LIST THE HIGHER LEVELS BELOW

LEVEL	NUMBER	COMPLETE NAME
PARENT COMMITTEE		
SUBCOMMITTEE		
OTHER (SPECIFY)		

9. PARENT ORGANIZATION

10. SECRETARIAT ORGANIZATION OR COUNTRY (IF DIFFERENT FROM PARENT ORGANIZATION)

11. DATE OF ASSIGNMENT (MONTH/YEAR)

12. EXPIRATION DATE OF ASSIGNMENT (IF ANY)

13A. TYPE OF COMMITTEE (BASE CLASSIFICATION ON TYPE OF COMMITTEE, NOT ORGANIZATION) (CHECK ONE)

13B. *NATIONAL COMMITTEE WITH MAJOR INTERNATIONAL RESPONSIBILITIES (IF YOU CHECKED NATL/INTL, PLEASE SPECIFY THE INTERNATIONAL COMMITTEE OR COMMITTEES WITH WHICH THE NATIONAL COMMITTEE IS CONCERNED.)

NATL	NATL/INTL*	INTL	
			STANDARDS
			PROFESSIONAL/SCIENTIFIC/TECHNICAL
			INTERAGENCY OR PUBLIC ADVISORY
			OTHER (SPECIFY)

14. POSITION ON COMMITTEE (CHECK ONE)

☐ MEMBER ☐ TECHNICAL ADVISOR

☐ CHAIR ☐ ALTERNATE REPRESENTATIVE

☐ VICE-CHAIR ☐ DELEGATE

☐ SECRETARY ☐ OTHER (SPECIFY)

15. VOTING STATUS (CHECK ONE)

☐ VOTING ☐ NONVOTING

16. TYPE OF FUNDING (CHECK ONE)

☐ NIST

☐ OA (SPECIFY)

☐ NIST/OA (SPECIFY AGENCY)

☐ OTHER (SPECIFY)

17. KEY WORDS (COMMITTEE MONITORING OFFICE USE ONLY)

18. APPROVAL

DIVISION CHIEF (OR HIGHER) (NAME AND SIGNATURE)	DATE	COMMITTEE MONITORING OFFICE (NAME AND SIGNATURE)	DATE

ADMINISTRATION/IPSG ELECTRONIC FORM

INSTRUCTIONS FOR COMPLETING FORM NIST-83

INTRODUCTION

FOR FURTHER INFORMATION, INCLUDING DEFINITIONS OF TERMS USED ON FORM NIST-83, REFER TO NIST ADMINISTRATIVE MANUAL SUBCHAPTER 3.02, STANDARDS AND PROFESSIONAL COMMITTEES. ANY QUESTIONS OR SUGGESTIONS FOR IMPROVING FORM NIST-83 SHOULD BE DIRECTED TO THE STANDARDS INFORMATION PROGRAM, SAMI PROJECT (DIVISION 217), WHICH SERVES AS THE NIST COMMITTEE MONITORING OFFICE. MAILING ADDRESS: BUILDING 820, ROOM 164, TELEPHONE NUMBER 301-975-4035.

GENERAL INFORMATION

1. A SEPARATE FORM SHOULD BE COMPLETED FOR EACH COMMITTEE. FOR EXAMPLE, IF YOU BELONG TO A COMMITTEE AND TWO OF ITS SUBCOMMITTEES, THREE FORMS SHOULD BE COMPLETED.

2. FORMS SHOULD BE FILED AS SOON AS POSSIBLE AFTER JOINING OR APPLYING FOR MEMBERSHIP ON A COMMITTEE. EMPLOYEES ARE RESPONSIBLE FOR COMPLETING AND RETURNING TO THE COMMITTEE OR PARENT ORGANIZATION ANY FORMS REQUIRED.

3. ADDITIONAL FORMS SHOULD BE FILED TO INDICATE CHANGES TO THE ORIGINAL FORM, TO RENEW EXPIRED MEMBERSHIPS, AND TO RECORD RESIGNATIONS. FORMS NEED NOT BE FILED FOR INTERNAL NIST COMMITTEES.

4. COPIES AND DISTRIBUTION - THE ORIGINAL AND TWO COPIES OF FORM NIST-83 ARE TO BE SENT TO THE DESIGNATED INDIVIDUALS FOR APPROVAL (SEE APPROVALS).

SPECIFIC COMMENTS

BLOCKS 1 - 6   MINOR CHANGES SUCH AS TELEPHONE EXTENSION OR MAILING ADDRESS MAY BE MADE BY NOTIFYING THE COMMITTEE MONITORING OFFICE BY TELEPHONE (301-975-4035) OR MEMORANDUM (BUILDING 820, ROOM 164). IF YOU ARE RESIGNING FROM A COMMITTEE, COMPLETE ONLY BLOCKS 1 - 9.

BLOCK 10   NAME OF AN ORGANIZATION OR COUNTRY ONLY, NOT AN INDIVIDUAL.

BLOCK 11   IF YOU HAVE BEEN ACCREDITED AS A DELEGATE TO A SPECIFIC MEETING, PUT THE STARTING DATE OF THE MEETING IN THIS BLOCK. IF YOU HAVE BEEN ASKED TO SERVE AS A DELEGATE FOR AN INDEFINITE TIME, PUT THE DATE YOU ACCEPTED THE ASSIGNMENT IN THIS BLOCK.

BLOCK 13A   INTERAGENCY COMMITTEE MEANS A COMMITTEE COMPOSED WHOLLY OF EMPLOYEES OF TWO OR MORE FEDERAL GOVERNMENT AGENCIES. PUBLIC ADVISORY COMMITTEE MEANS ANY COMMITTEE THAT IS (1) ESTABLISHED BY FEDERAL STATUTE OR REORGANIZATION PLAN; (2) ESTABLISHED OR UTILIZED BY THE PRESIDENT; OR (3) ESTABLISHED OR UTILIZED BY ONE OR MORE AGENCIES TO OBTAIN ADVICE OR RECOMMENDATIONS FOR THE PRESIDENT OR FOR ONE OR MORE FEDERAL GOVERNMENT AGENCIES. THE TERM DOES NOT INCLUDE ANY COMMITTEE WHICH IS COMPOSED WHOLLY OF EMPLOYEES OF THE FEDERAL GOVERNMENT.

BLOCK 14   INDICATE YOUR CURRENT POSITION ON THE ACTIVITY LISTED IN BLOCK 8A. IF YOU SERVE IN MORE THAN ONE CAPACITY, CHECK ONLY THE HIGHEST POSITION HELD.

BLOCK 16   INDICATE THE ORGANIZATION WHICH PAYS FOR YOUR TIME, TRAVEL, OR OTHER EXPENSES WHEN YOU ARE INVOLVED IN COMMITTEE WORK.

BLOCK 17   DO NOT FILL OUT. FOR COMMITTEE MONITORING OFFICE USE ONLY.

APPROVALS - (FOR FURTHER EXPLANATION OF THE TYPES OF REPRESENTATION, REFER TO NIST ADMINISTRATIVE MANUAL SUBCHAPTER 3.02, STANDARDS AND PROFESSIONAL COMMITTEES.)

BLOCK 18

(1) IF A NIST TECHNICAL REPRESENTATIVE - SEND THE ORIGINAL AND TWO COPIES OF FORM NIST-83 TO THE DIVISION CHIEF (OR HIGHER) FOR APPROVAL DIVISION CHIEFS AND HIGHER LEVEL MANAGERS SHOULD SIGN THEIR OWN FORMS. AFTER APPROVAL IS OBTAINED, SEND THE FORM TO THE OFFICE OF STANDARDS INFORMATION PROGRAM, WHICH SERVES AS THE NIST COMMITTEE MONITORING OFFICE, FOR PROCESSING.

(2) IF AN OFFICIAL NIST SPOKESMAN - SEND THE ORIGINAL AND TWO COPIES OF FORM NIST-83 WITH A COVER MEMORANDUM EXPLAINING THE ASSIGNMENT THROUGH THE DIVISION/CENTER OFFICE TO THE OU DIRECTOR FOR APPROVAL. AFTER APPROVAL, THE OU DIRECTOR FORWARDS THE MATERIAL TO THE OFFICE OF STANDARDS INFORMATION PROGRAM, WHICH SERVES AS THE NIST COMMITTEE MONITORING OFFICE FOR REVIEW AND FORWARDING TO THE DIRECTOR.

NOTE TO SIGNERS - YOUR SIGNATURE INDICATES THAT:

(1) THE ACTIVITY IS DIRECTLY RELATED TO THE AUTHORIZED FUNCTIONS OF NIST;

(2) THE APPOINTEE IS QUALIFIED AND CAN DEVOTE ENOUGH TIME AND EFFORT TO SERVE CREDITABLY; AND

(3) THERE ARE ADEQUATE RESOURCES AVAILABLE OR IN PROSPECT TO SUPPORT MEANINGFUL PARTICIPATION.